

WHAT IS CLAIMED IS:

1. A magnetic bearing for supporting a rotatable member including a thrust disc with respect to a stationary member comprising:

first magnetic field generating means for generating an axially polarized magnetic field linked magnetically through first and second air gaps between the rotatable member and the stationary member, the first axially polarized magnetic field generating means comprising first and second arcuate members of high magnetic permeability and a single controllable electromagnetic coil circumferentially positioned about said first and second arcuate members and radially spaced from the rotatable member; and

second magnetic field generating means for generating a radially polarized magnetic field and being linked magnetically to the rotatable member through an air gap between the thrust disc and a radial pole assembly to provide radial magnetic flux coupling of the rotatable member to the stationary member.

2. The magnet bearing of claim 1 wherein said axially polarized magnetic field flows through first and second axial poles.
3. The magnetic bearing of Claim 2 wherein said first and said second arcuate members each comprise a plurality of magnetic segments.
4. The magnetic bearing of claim 2 wherein said first and second members comprise continuous magnetic members.

5. The magnetic bearing of claim 3 wherein the magnetic segments comprising said first and arcuate members are affixed to the sides of said first axial pole and magnetic segments comprising said second arcuate members are affixed to the sides of said second axial pole.

6. A magnetic bearing for supporting a rotatable member including a thrust disc with respect to a stationary member comprising:

first magnetic field generating means for generating an axially polarized magnetic field linked magnetically through first and second air gaps between the rotatable member and the stationary member, the first axially polarized magnetic field generating means comprising first and second arcuate members of high magnetic permeability; and

second magnetic field generating means for generating a radially polarized magnetic field and being linked magnetically to the rotatable member through an air gap between the thrust disc and a radial pole assembly to provide radial magnetic flux coupling of the rotatable member to the stationary member.

7. The magnetic bearing of claim 6 wherein said axially polarized magnetic field flows through first and second axial poles.

8. The magnetic bearing of Claim 7 wherein said first and said second arcuate members each comprise a plurality of magnetic segments.

9. The magnetic bearing of claim 7 wherein said first and second members comprise continuous magnetic members.

10. The magnetic bearing of claim 8 wherein the magnetic segments comprising said first and arcuate members are affixed to the sides of said first axial pole and magnetic segments comprising said second arcuate members are affixed to the sides of said second axial pole.

11. A magnetic bearing for supporting a rotatable member including a thrust disc with respect to a stationary member comprising:

first magnetic field generating means for generating an axially polarized magnetic field linked magnetically through first and second air gaps between the rotatable member and the stationary member, the first axially polarized magnetic field generating means comprising first and second arcuate members of high magnetic permeability, said axially polarized magnetic field flowing through said first and second axial poles; and

a single controllable electromagnetic coil circumferentially positioned about said first and second arcuate members and radially spaced from the rotatable member.

12. The magnetic bearing of Claim 11 wherein said first and said second arcuate members each comprise a plurality of magnetic segments.

13. The magnetic bearing of claim 11 wherein said first and second members comprise continuous magnetic members.

14. The magnetic bearing of claim 12 wherein the magnetic segments comprising said first and arcuate members are affixed to the sides of said first axial pole and magnetic segments comprising said second arcuate members are affixed to the sides of said second pole.

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